The Florida Water and Climate Alliance

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The Florida Water and Climate Alliance

Funded by NOAA Climate Program Office

- Partnership of:
  - Water utilities
  - State agencies
  - Researchers
  - Local governments
- Formed in 2010

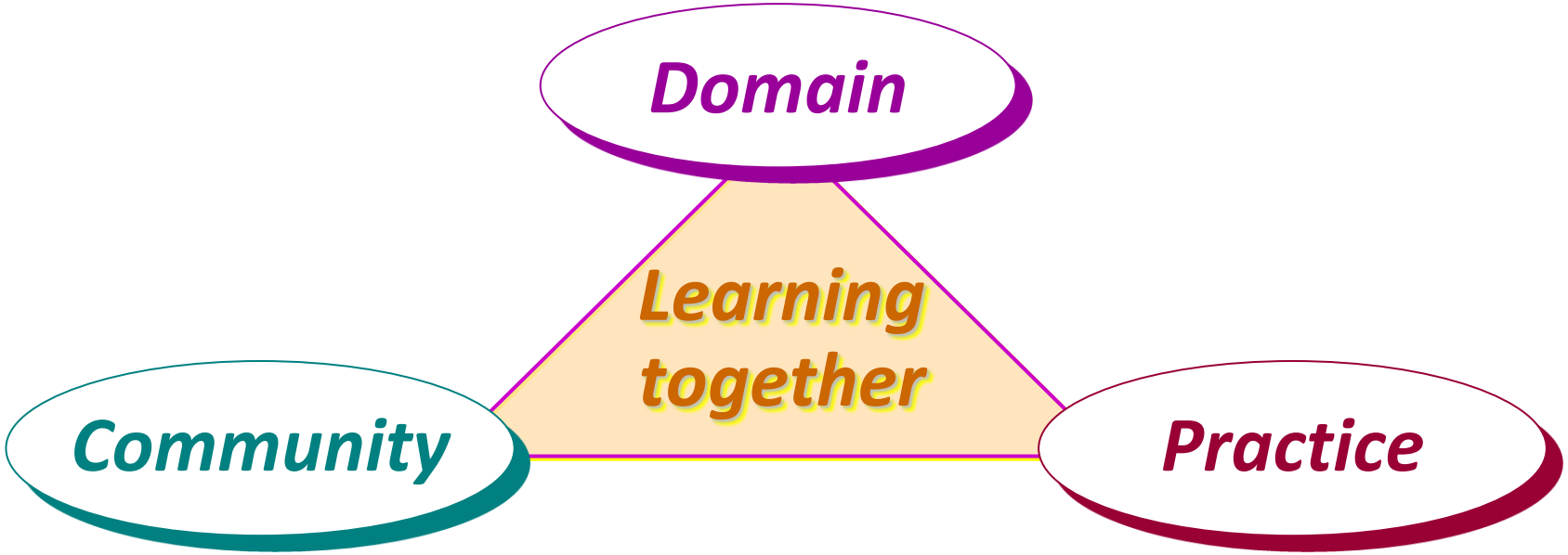
The Florida Water and Climate Alliance

<u>Goal</u>:

To **<u>increase the regional relevance and usability</u>** of climate and sea level rise models for the specific needs of water suppliers and resources managers in Florida.

A Collaborative Working Group

Actionable climate science - Data/models/tools



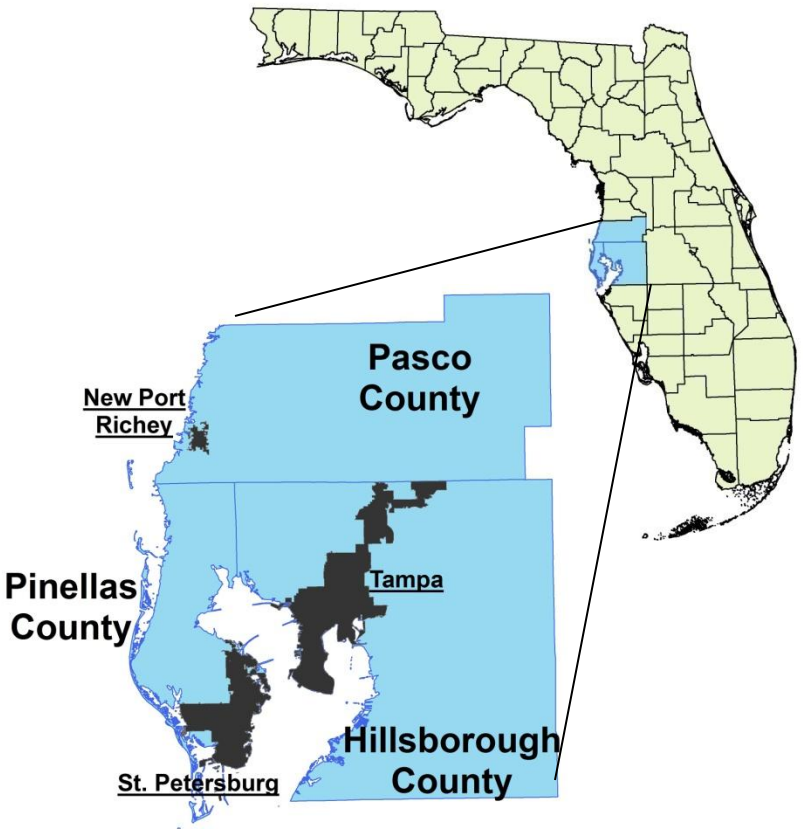
Public water suppliers, resource managers, climate, social and hydrologic scientists, local planners

Workshops, projects, research, website, reports, emails, personal communication, outreach

Based on: Wenger, Etienne, Communities of Practice presentation at UF, May 2009

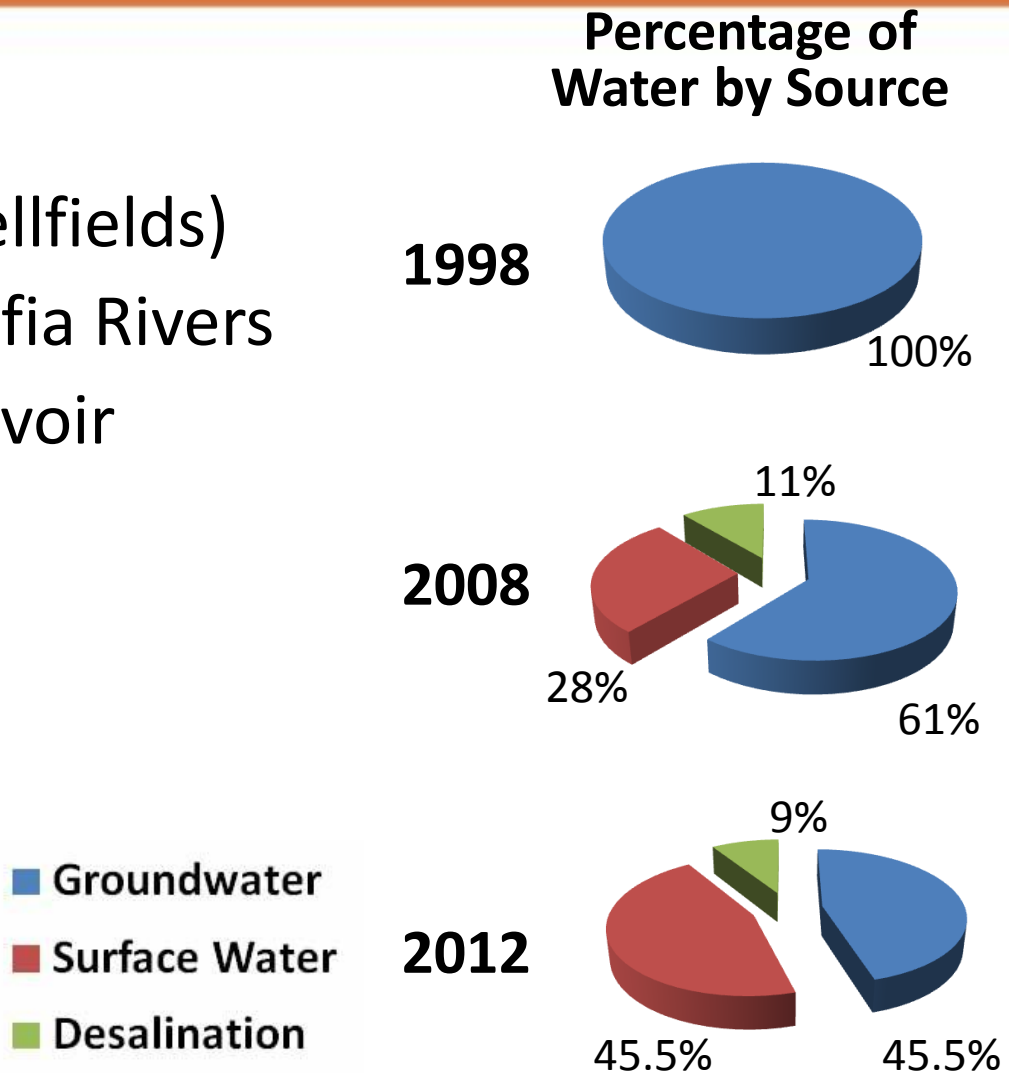
Tampa Bay Water

- Regional wholesale water supply authority
- Non-profit, special district created by inter-local agreement
- 6 member governments
- Serving 2+ million people



Tampa Bay Water

- Current sources:
  - Groundwater (13 Wellfields)
  - Hillsborough and Alafia Rivers
  - C.W. Bill Young Reservoir
  - Desalination Plant

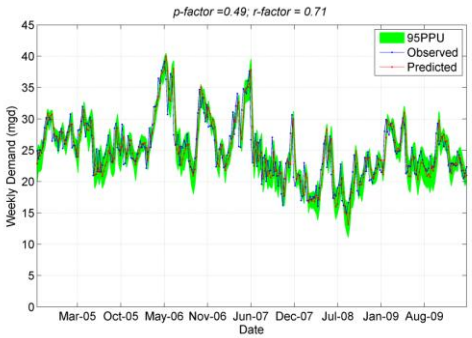


Links Between Information and Decisions

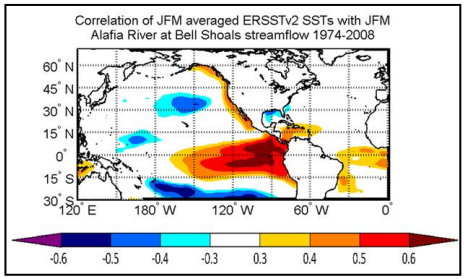
Decision	Time-Scale	Required Information
Operational Allocations	1 Week to 1 Month	Demand forecasts
Update water-year Allocations	1 Month to 12 Months	Streamflow forecasts
Infrastructure	Decades	Precipitation, Temperature, Streamflow, and Demand Projections

Products at Multiple Scales

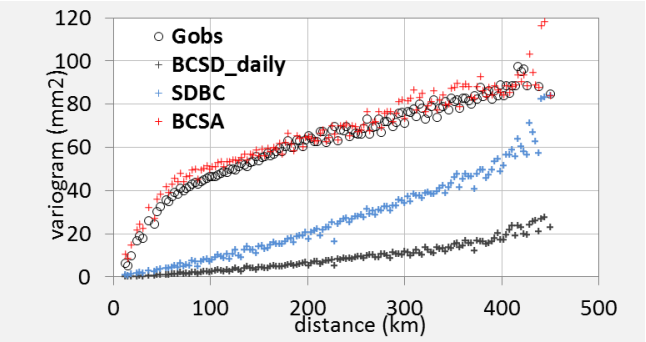
- Weekly Demand Forecasts
  - Global Ensemble Forecast System (GEFS)
  - Reduced uncertainty



- Seasonal Streamflow Forecasts
  - El Niño/Southern Oscillation
  - Probability of Exceedance

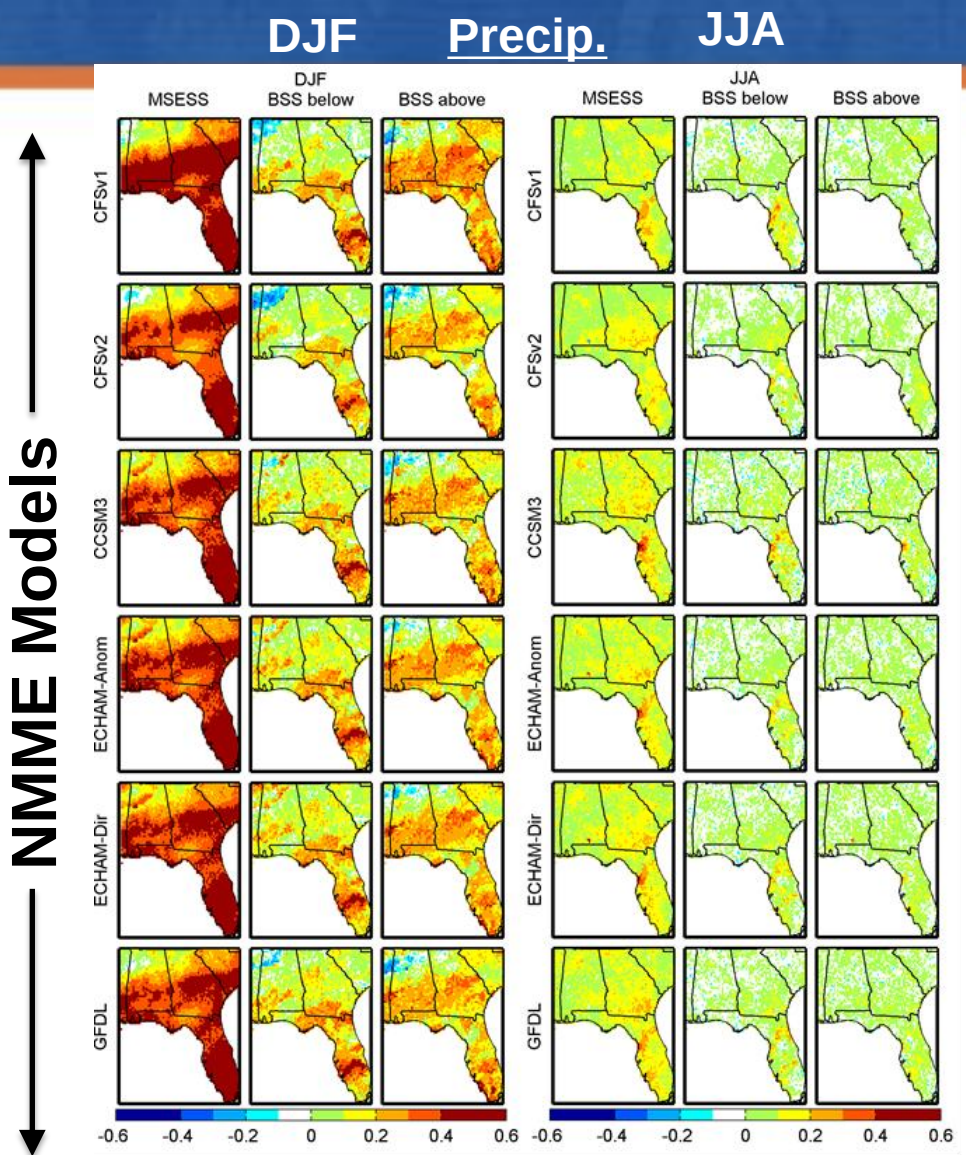


- Downscaling Future Climate
  - Multiple GCMs
  - Hydrologic Applications



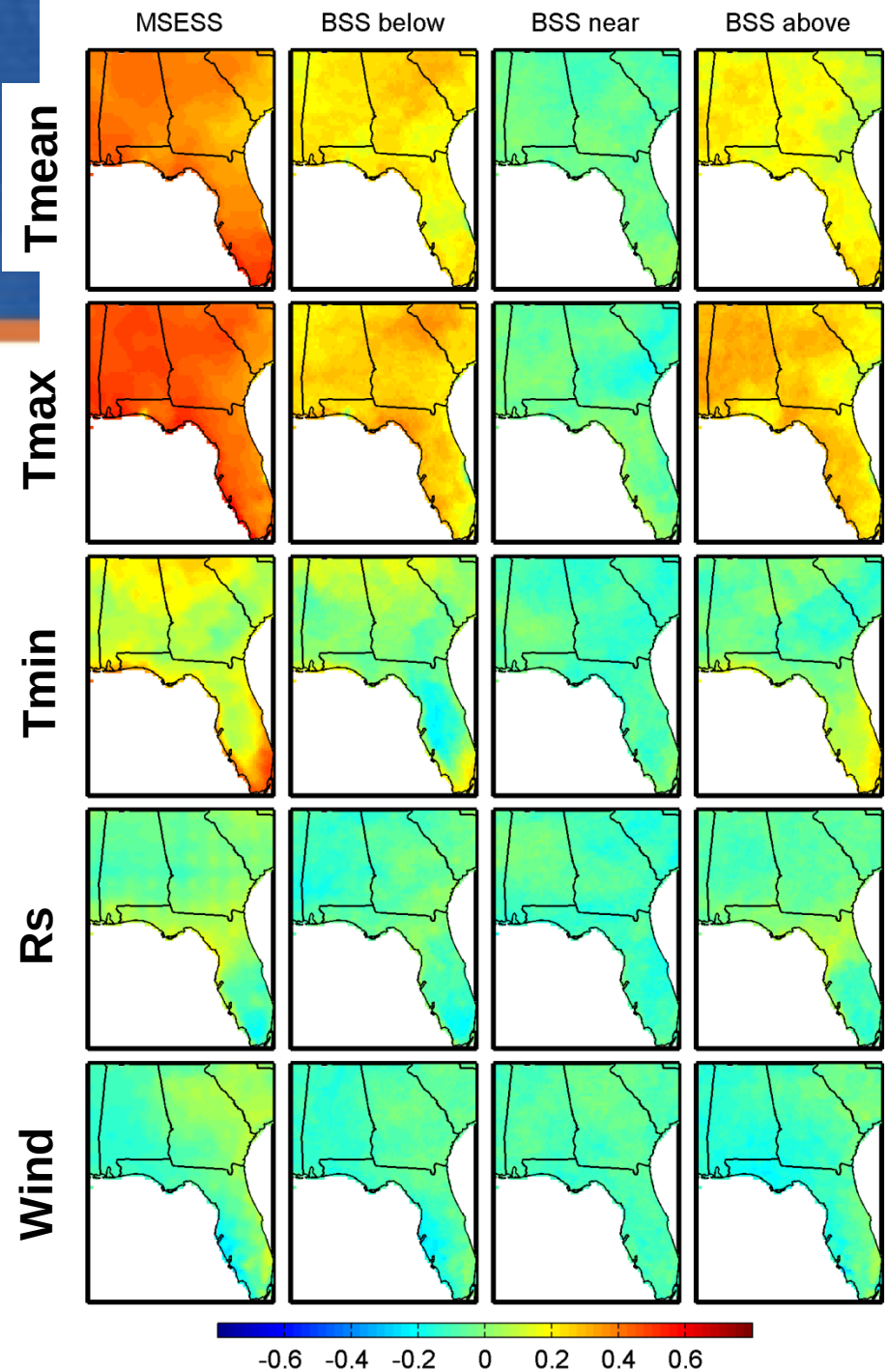
Seasonal Forecasts using the National Multi-Model Ensemble (NMME)

- 6 GCMs downscaled to 12 km
- Multiple downscaling methods



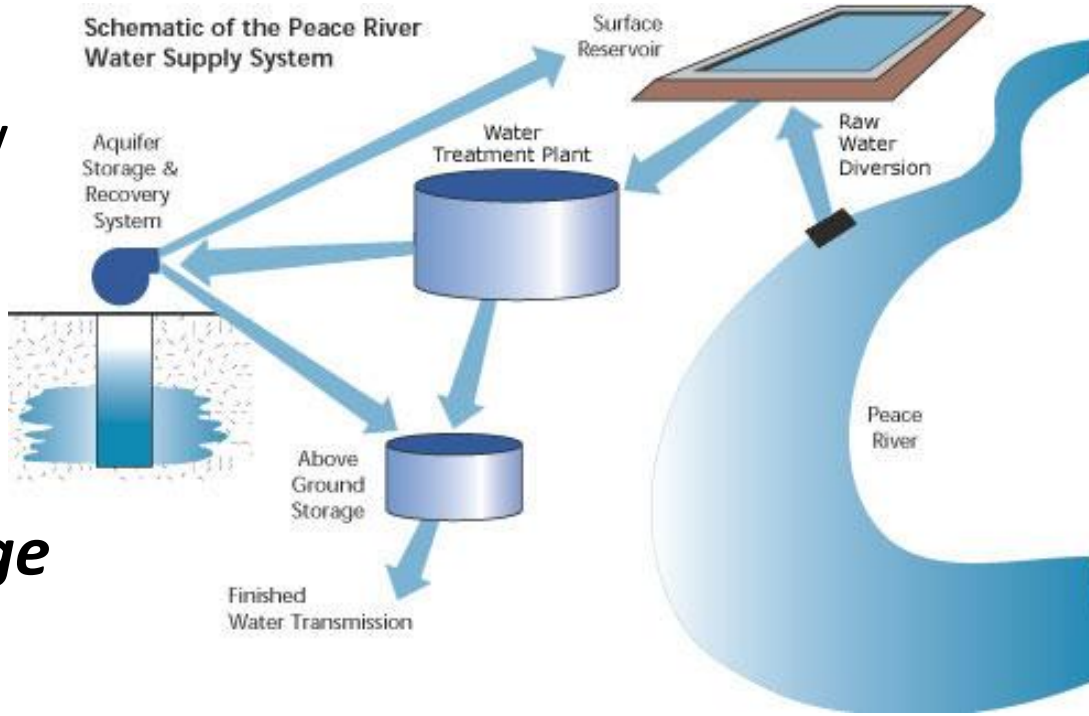
Seasonal Reference Evapotranspiration

- Climate Forecast System v2 (CFSv2)
- Downscaled to 12 km
- Penman Monteith
- **<u>Skill highest in winter & during ENSO events</u>**



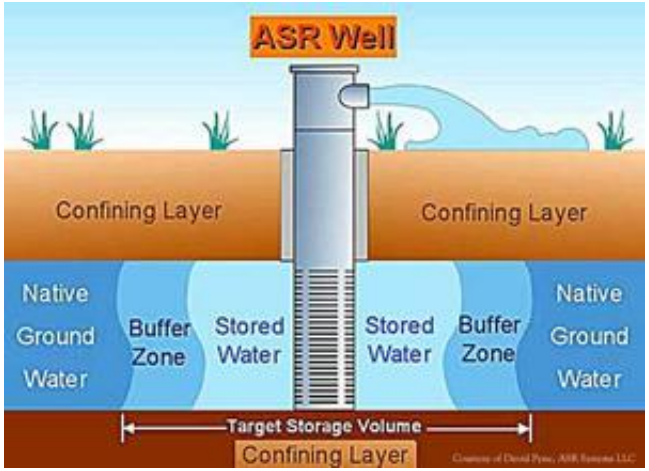
Peace River Manasota Regional Water Supply Authority

- Regional wholesale water supply authority
- Peace River is the only source
- Reservoir
- Largest ***Aquifer Storage and Recovery (ASR)*** East of the Mississippi



When to start ASR recovery?

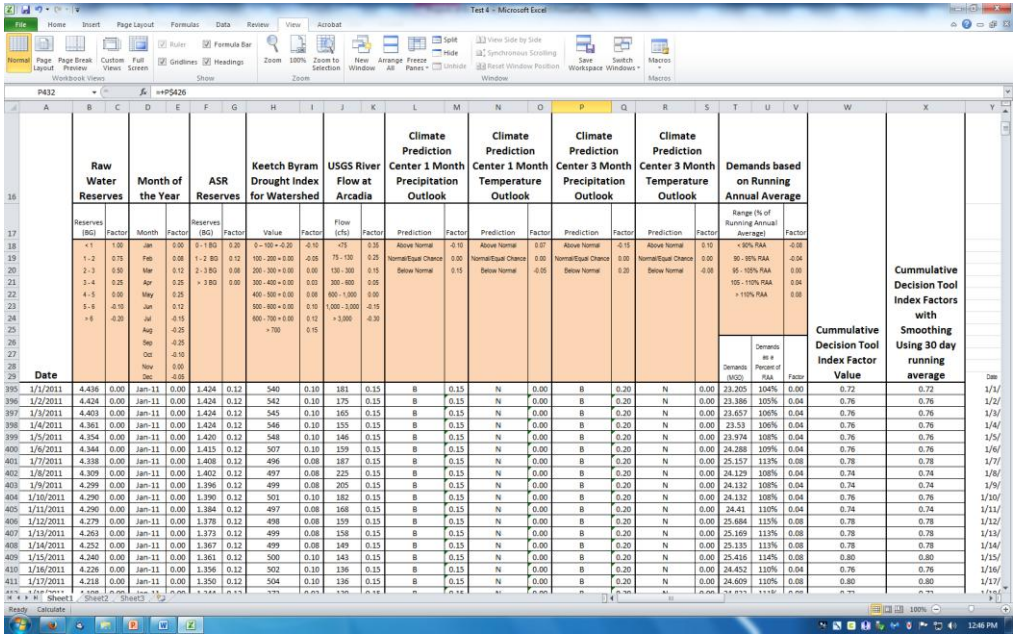
- **Too Soon**:
  - Costs rise (ASR Water treated twice!)
  - Higher TDS (blended water quality issue)
- **Too Late**:
  - Less reservoir water to dilute TDS of ASR water
  - Water restrictions
  - Salt water upconing



Aquifer Storage and Recovery

- **<u>Decision Support Tool</u>**:
  - Keetch Byram Drought Index (KBDI)
  - CPC 1 Month Outlooks
  - CPC 3 Month Outlooks
  - Raw water reserves
  - ASR reserves
  - River flow

- ***Different Weights***



Date	Raw Water Reserves (BG)	Factor	Month of the Year	Factor	ASR Reserves (BG)	Factor	Keetch Byram Drought Index for Watershed Value	Factor	USGS River Flow at Arcadia (cfs)	Factor	Climate Prediction Center 1 Month Precipitation Outlook Prediction	Factor	Climate Prediction Center 1 Month Temperature Outlook Prediction	Factor	Climate Prediction Center 3 Month Precipitation Outlook Prediction	Factor	Climate Prediction Center 3 Month Temperature Outlook Prediction	Factor	Demands based on Running Annual Average Demands (MGD)	Demands as a Percent of RAA	Factor	Cummulative Decision Tool Index Factor Value	Cummulative Decision Tool Index Factors with Smoothing Using 30 day running average	Date
	< 1	1.00	Jan	0.00	0 - 1 BG	0.20	0 - 100 = -0.20	-0.10	<75	0.35	Above Normal	-0.10	Above Normal	0.07	Above Normal	-0.15	Above Normal	0.10	< 80% RAA		-0.08			
	1 - 2	0.75	Feb	0.00	1 - 2 BG	0.12	100 - 200 = 0.00	-0.05	75 - 130	0.25	Normal/Equal Chance	0.00	Normal/Equal Chance	0.00	Normal/Equal Chance	0.00	Normal/Equal Chance	0.00	90 - 95% RAA		-0.04			
	2 - 3	0.50	Mar	0.12	2 - 3 BG	0.08	200 - 300 = 0.00	0.00	130 - 300	0.15	Below Normal	0.15	Below Normal	-0.05	Below Normal	0.20	Below Normal	-0.08	95 - 105% RAA		0.00			
	3 - 4	0.25	Apr	0.25	> 3 BG	0.00	300 - 400 = 0.00	0.03	300 - 600	0.05									105 - 110% RAA		0.04			
	4 - 5	0.00	May	0.25			400 - 500 = 0.00	0.08	600 - 1,000	0.00									> 110% RAA		0.08			
	5 - 6	-0.10	Jun	0.12			500 - 600 = 0.00	0.10	1,000 - 3,000	-0.15														
	> 6	-0.20	Jul	-0.15			600 - 700 = 0.00	0.12	> 3,000	-0.30														
			Aug	-0.25			> 700	0.15																
			Sep	-0.25																				
			Oct	-0.10																				
			Nov	0.00																				
			Dec	-0.05																				
1/1/2011	4.436	0.00	Jan-11	0.00	1.424	0.12	540	0.10	181	0.15	B	0.15	N	0.00	B	0.20	N	0.00	23.205	104%	0.00	0.72	0.72	1/1/
1/2/2011	4.424	0.00	Jan-11	0.00	1.424	0.12	542	0.10	175	0.15	B	0.15	N	0.00	B	0.20	N	0.00	23.386	105%	0.04	0.76	0.76	1/2/
1/3/2011	4.403	0.00	Jan-11	0.00	1.424	0.12	545	0.10	165	0.15	B	0.15	N	0.00	B	0.20	N	0.00	23.657	106%	0.04	0.76	0.76	1/3/
1/4/2011	4.361	0.00	Jan-11	0.00	1.424	0.12	546	0.10	155	0.15	B	0.15	N	0.00	B	0.20	N	0.00	23.53	106%	0.04	0.76	0.76	1/4/
1/5/2011	4.354	0.00	Jan-11	0.00	1.420	0.12	548	0.10	146	0.15	B	0.15	N	0.00	B	0.20	N	0.00	23.974	108%	0.04	0.76	0.76	1/5/
1/6/2011	4.344	0.00	Jan-11	0.00	1.415	0.12	507	0.10	159	0.15	B	0.15	N	0.00	B	0.20	N	0.00	24.288	109%	0.04	0.76	0.76	1/6/
1/7/2011	4.338	0.00	Jan-11	0.00	1.408	0.12	496	0.08	187	0.15	B	0.15	N	0.00	B	0.20	N	0.00	25.157	113%	0.08	0.78	0.78	1/7/
1/8/2011	4.309	0.00	Jan-11	0.00	1.402	0.12	497	0.08	225	0.15	B	0.15	N	0.00	B	0.20	N	0.00	24.129	108%	0.04	0.74	0.74	1/8/
1/9/2011	4.299	0.00	Jan-11	0.00	1.396	0.12	499	0.08	205	0.15	B	0.15	N	0.00	B	0.20	N	0.00	24.132	108%	0.04	0.74	0.74	1/9/
1/10/2011	4.290	0.00	Jan-11	0.00	1.390	0.12	501	0.10	182	0.15	B	0.15	N	0.00	B	0.20	N	0.00	24.132	108%	0.04	0.76	0.76	1/10/
1/11/2011	4.290	0.00	Jan-11	0.00	1.384	0.12	497	0.08	168	0.15	B	0.15	N	0.00	B	0.20	N	0.00	24.41	110%	0.04	0.74	0.74	1/11/
1/12/2011	4.279	0.00	Jan-11	0.00	1.378	0.12	498	0.08	159	0.15	B	0.15	N	0.00	B	0.20	N	0.00	25.684	115%	0.08	0.78	0.78	1/12/
1/13/2011	4.263	0.00	Jan-11	0.00	1.373	0.12	499	0.08	158	0.15	B	0.15	N	0.00	B	0.20	N	0.00	25.169	113%	0.08	0.78	0.78	1/13/
1/14/2011	4.252	0.00	Jan-11	0.00	1.367	0.12	499	0.08	149	0.15	B	0.15	N	0.00	B	0.20	N	0.00	25.135	113%	0.08	0.78	0.78	1/14/
1/15/2011	4.240	0.00	Jan-11	0.00	1.361	0.12	500	0.10	143	0.15	B	0.15	N	0.00	B	0.20	N	0.00	25.416	114%	0.08	0.80	0.80	1/15/
1/16/2011	4.226	0.00	Jan-11	0.00	1.356	0.12	502	0.10	136	0.15	B	0.15	N	0.00	B	0.20	N	0.00	24.452	110%	0.04	0.76	0.76	1/16/
1/17/2011	4.218	0.00	Jan-11	0.00	1.350	0.12	504	0.10	136	0.15	B	0.15	N	0.00	B	0.20	N	0.00	24.609	110%	0.08	0.80	0.80	1/17/

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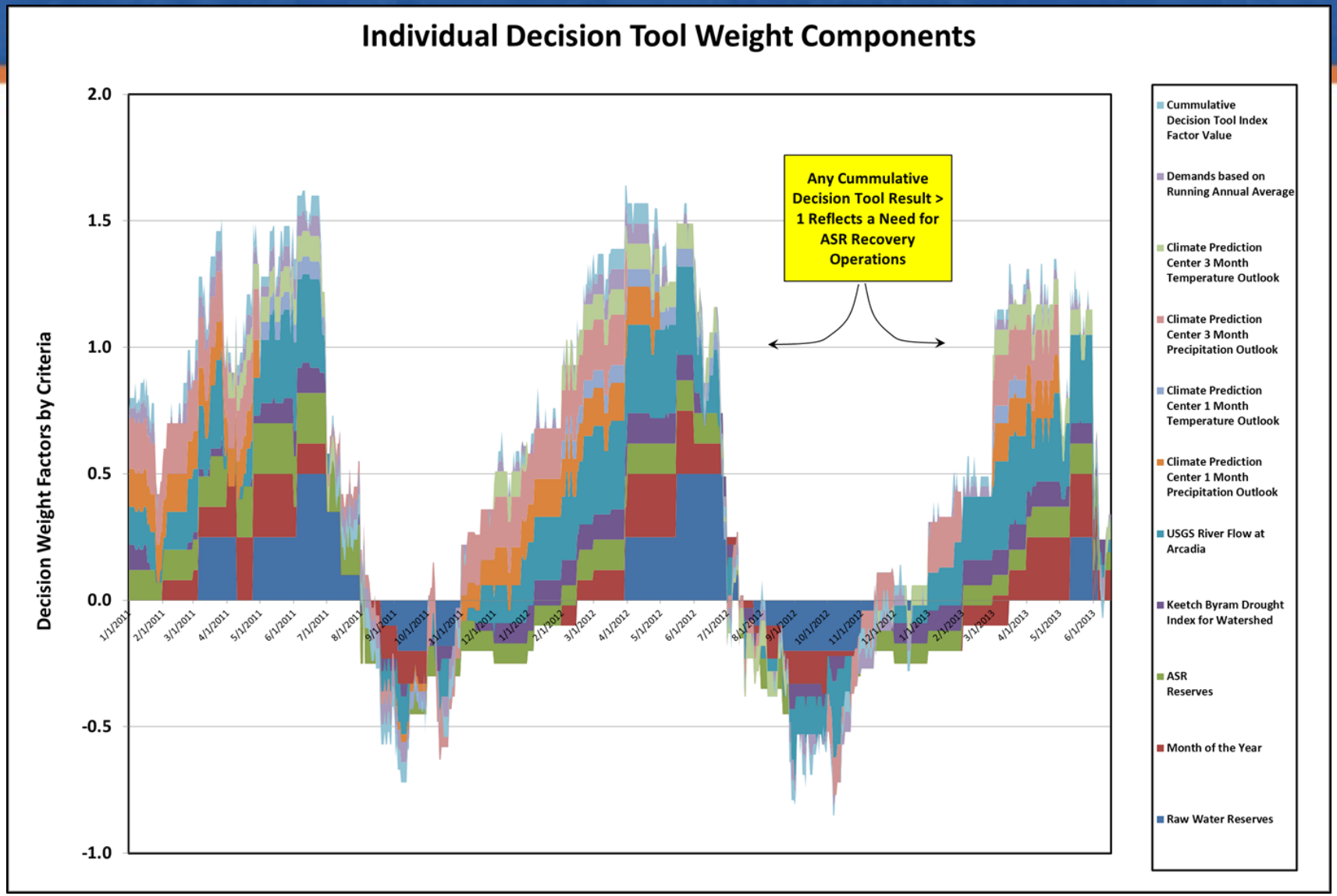

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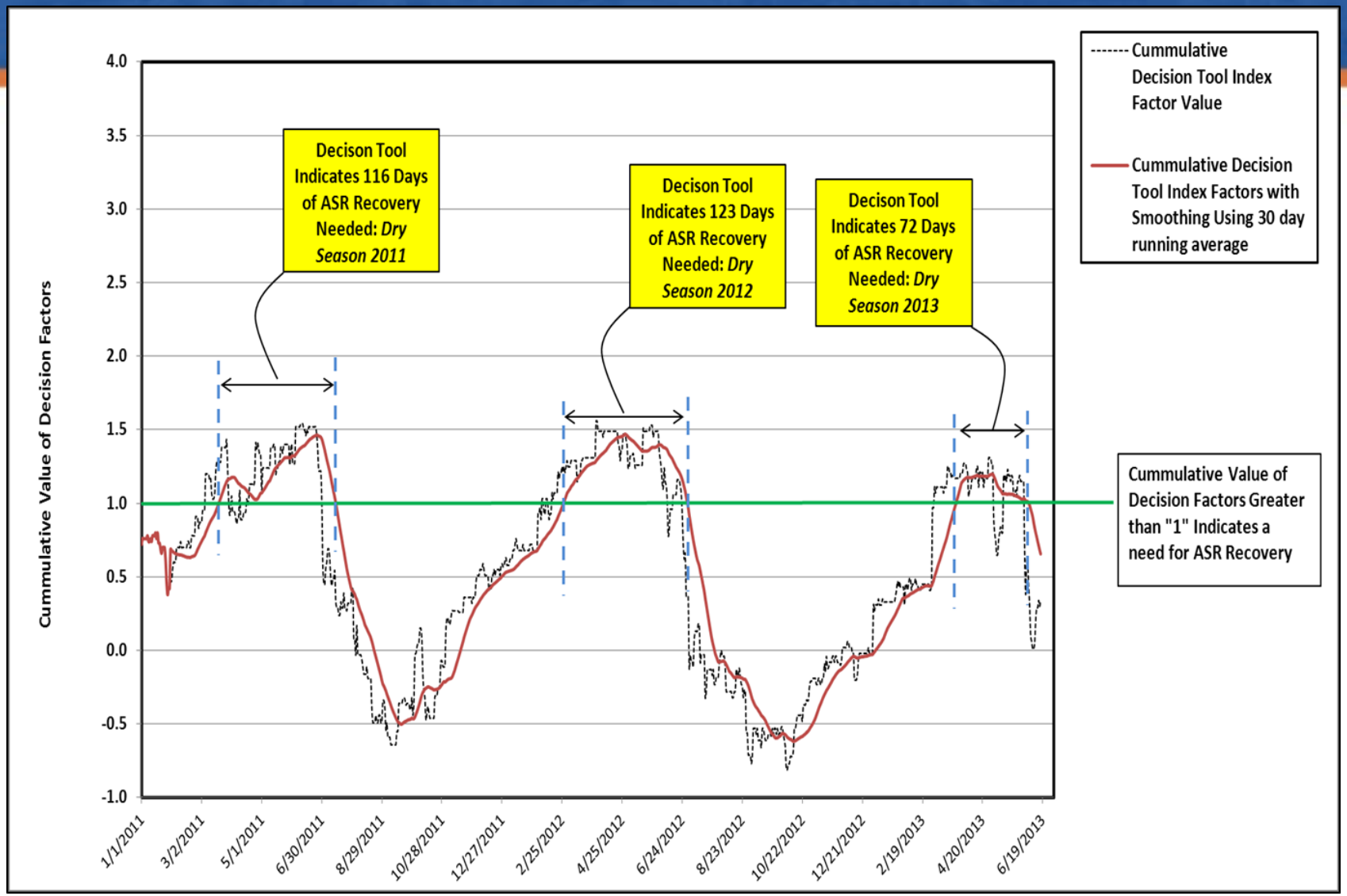

The Florida Water and Climate Alliance

- Strengths
  - Collaborative
  - Champions
  - University Extension
- Weaknesses
  - Funding
- The Future
  - New Governance Structure
  - Sustained Funding

www.FloridaWCA.org